

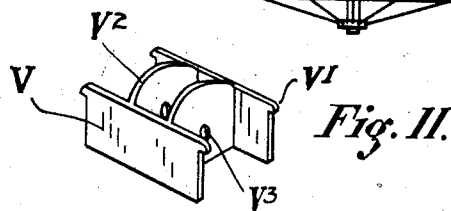
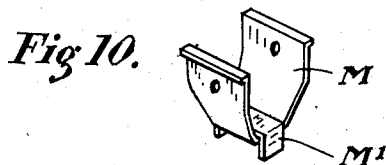
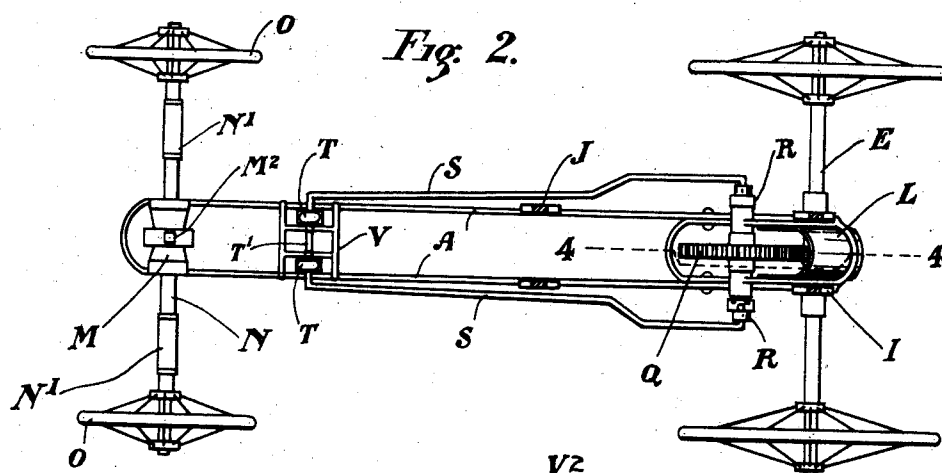
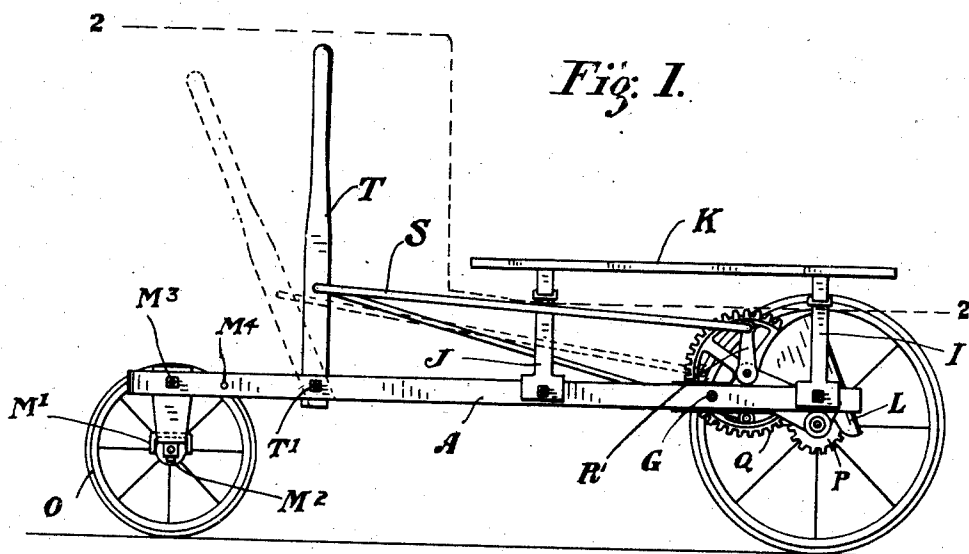
No. 879,090.

J. E. DURHAM.
HAND CAR.

PATENTED FEB. 11, 1908.

APPLICATION FILED JULY 28, 1906.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

Fig. 4.

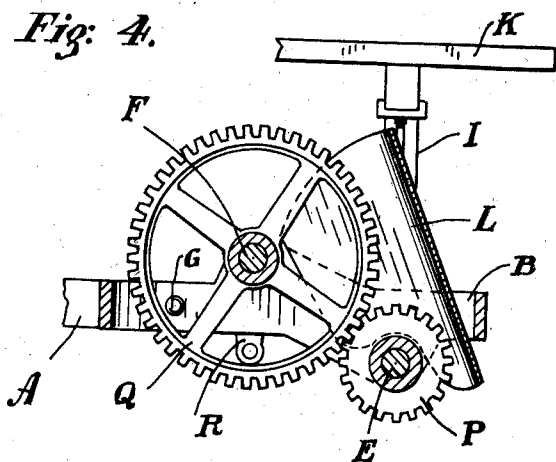


Fig. 3.

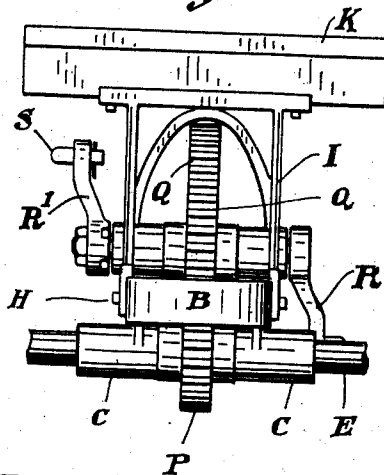


Fig. 5.

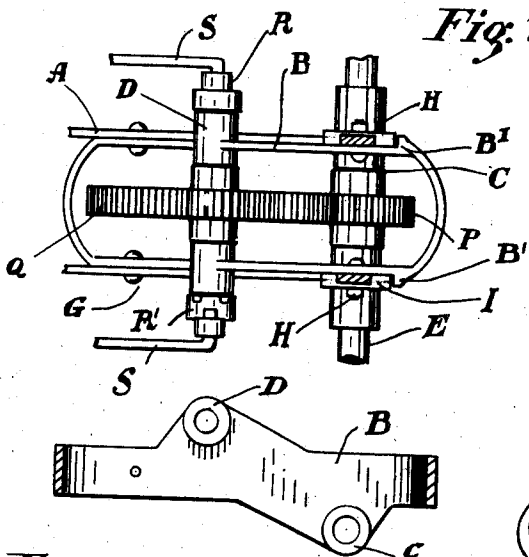


Fig. 6.

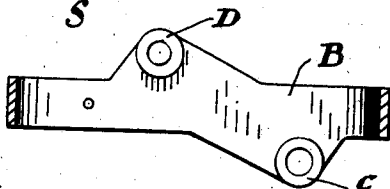


Fig. 7.

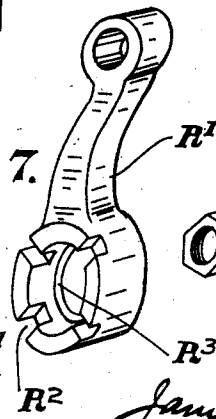
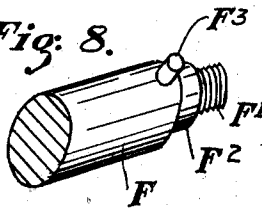


Fig. 9.



Fig. 8.



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UNITED STATES PATENT OFFICE.

JAMES E. DURHAM, OF MUNCIE, INDIANA.

HAND-CAR.

No. 879,090.

Specification of Letters Patent.

Patented Feb. 11, 1908.

Application filed July 28, 1906. Serial No. 328,206.

To all whom it may concern:

Be it known that I, JAMES E. DURHAM, of Muncie, Delaware county, in the State of Indiana, have invented a new and useful Hand-Car, of which the following is a specification.

My invention relates to improvements in hand cars wherein the driving of the machine is accomplished by the oscillation of hand levers by the operator, and has for its object to provide such a car which will be strong and durable, light in weight, and easily and economically constructed, and of few parts; a further object is to provide facilities whereby the motion of the oscillating levers with reference to each other may be easily varied and regulated.

A further object is to afford means whereby the bearings for the working parts of the gearing may be retained in correct position each to the other, and correct position with reference to the frame of the car.

These and other objects are accomplished by the mechanism and construction set out in the following description, and designated in the claims, and illustrated in the accompanying drawings in which similar letters and numerals of reference refer to similar parts throughout the several views.

In the drawings Figure 1 is a side view of my improved car complete, the wheels being removed from its left-hand side. Fig. 2 is a top plan view of the same on the line 2—2 Fig. 1; Fig. 3 is an enlarged rear view, the gear shield being removed, and the shaft broken away; Fig. 4 is an enlarged detached vertical longitudinal section of the gearing on the line 4—4 Fig. 2; Fig. 5 is an enlarged detached view of the gearing, the gear shield being removed and the seat-support I being broken away; Fig. 6 represents a detached vertical longitudinal section of the gear frame; Fig. 7 is an enlarged detached perspective view of the detachable crank; Fig. 8 is a detached enlarged perspective view of the end portion of the crank shaft; Fig. 9 the crank nut. Fig. 10 is a detached enlarged view in perspective of the king-block, and Fig. 11 is a detached enlarged perspective view of the drive-bar housing and guide-box.

Composed of a suitably proportioned metallic bar of proper length and curvilinearly bent at its central portion, the ends being brought about toward each other and so that the opposite portions of the bar are parallel to each other, as plainly shown in Fig. 1 and

Fig. 2, is the main-frame A of my improved hand car.

B designates the gear-frame of the conformation as shown in Fig. 5 and Fig. 6 and provided with the tongues B' against which the ends of the main-frame bar come into contact in assembling the complete frame; this gear-frame is of malleable casting and formed integral therewith are the journals C and D in which are journaled the rear-shaft E and the crank-shaft F. By this ingeniously formed gear-frame, bearings are provided above and below the main-frame and on either side thereof which will always be in true position each to the other and whereby the gearing through which the driving power is transmitted to the rear axle, is contained within the frame; and the gear-frame being inclosed by and becoming a part of the main-frame, thereby dispensing with the necessity of cumbersome shields about the forward part of the gearing, and affording in the gear-frame a combined housing for the gearing and a shield for the gearing, and a connecting member of rigidity for the main-frame and against the outer sides of which the bars of the main-frame may be readily secured. This gear-frame is secured to and between the bars of the main-frame A by the rivets G, and by the bolts H.

I designates the rear, and J, the front seat support. These supports have the bases of their oppositely disposed legs flanged so as to fit the frame bars, and are of the form as shown in Fig. 3, of suitable width and provided at their top portions with suitable grooves in which are supported and secured transversely extending battens upon which rest the seat K of appropriate width and length as shown in Fig. 1 and Fig. 3.

L designates a hood or shield of thin sheet metal so formed that when inserted in the gear-frame it will assume the position as shown in Figs. 1, 2 and 4, its upper portion in continuous contact with the arched web of the support I completely shielding the gear wheels and provided with holes in the side portions thereof so that in assembling the parts of the car, the sides of the gear-frame the sides of the shield, the bars of the frame A and the legs of the support I will be solidly secured together by the bolts H. The forward portion of the gear-frame is then rigidly secured to the bars of the main-frame, by the rivets G. The support J has the

function, in addition to that of supporting the frontal portion of the seat, of retaining the bars of the main-frame their accurate and proper distance apart. Secured in the forward end and between the bars of the main-frame, by the bolts M^3 , is the king block M to which the front-shaft N is horizontally pivotally secured at its center by the king-bolt M^2 .

O designates the front wheels in which the front-shaft N is journaled at its ends. This shaft is of such suitable length that the operator in position on the seat may place his feet thereon and control the direction of the movement forwardly or rearwardly of the machine. The clips N^1 rigidly secured to the front-shaft, as shown in Fig. 2, are provided to prevent the foot of the operator from unduly slipping transversely.

The king-block M is of the form as shown in Fig. 10 and is provided with the U-shaped clip M^1 , the depending tongues of which prevent the undue rotation horizontally of the front-shaft; this clip may be riveted to and be made a part of the king-block, or may be used as I have herein applied it.

M^2 is the king-bolt adapted to pass through the king-block and clip and through suitable aperture in the front-shaft, and to retain same all in correct position, the shaft being free to rotate within the scope of predetermined length. By this ingenious device the rotation of the shaft N is restricted to a certain extent, and the objectionable feature in hand cars as at present devised wherein the front axle shaft is free to rotate completely, is overcome.

Rigidly secured to the rear-shaft E and between the journals C, is the gear-wheel P which meshes with the gear wheel Q rigidly secured to the crank shaft F. Rigidly secured to the end of this crank shaft is the crank R, and to its opposite end is detachably and adjustably secured the crank R^1 . Pivotally secured in the heads of the cranks are the connecting rods S of suitable length and form to connect the cranks to the driving-bars T. The mode of the connection of these rods, as will readily be observed is old, the ends being turned angularly and retained loosely in correct position in their bearings by suitable means, such as cotter pins.

One of the principal features of my invention resides in the novel means whereby I accomplish the variation of the position of the driving-bars T with reference to each other; the object being to afford a variety of action for the operator such as the normal oscillation of the levers oppositely each to the other, arranged as shown in Figs. 1 and 2; secondly, the oscillation in unison of the levers; and thirdly, the oscillation of the levers positioned "on the quarter" as shown in the dotted lines in Fig. 1, in this last named movement, the "dead center" being

entirely overcome. These advantages are accomplished by the application of the ingeniously devised crank R^1 , its hub being provided on its inner face with the radially extending channels R^2 and being bored so that the shoulder R^3 is provided. The crank R is rigidly secured to the end of the shaft F which is then inserted in the journal D, the gear Q is rigidly secured thereto by proper means, and thence the shaft is passed on through the oppositely positioned like journal; the pin F^3 is then secured in the end of the shaft, as shown in Fig. 8, and is of such length that its ends will protrude slightly, affording a bearing against the outer face of the journal D whereby lateral motion of the shaft will be prevented. This pin F^3 performs the additional and chief function of lock-bar for the crank R^1 . The crank R^1 is then applied to the shaft, the shoulder R^3 will fit snugly against the face of the shoulder F^2 and the pin F^3 will reside within the channels R^2 ; the nut U is then screwed on the threaded end F^1 and the crank tightened and securely retained in position. Thus it will be observed that to enable the regulation of the relative position of the driving-bars, all that is necessary to do is to loosen the nut U until the channels R^2 are clear of the pin F^3 , then rotate the crank, a quarter or half turn, as may be desired, then tighten into position as just described. By this simple and ingenious means the necessity of removal of any part or connection is obviated and there is obtained a simple and efficient combined means of assembling the parts and of adjusting, and of adjustably securing the crank R^1 .

V designates the drive-bar housing and guide box, as shown in Fig. 11; this member is of malleable casting and is provided with the projections V^1 and is of proper width to form a separator and brace for the bars of the main-frame A. The vertical longitudinal partitions V^2 are extended upwardly and so adapted to form guides for the drive-bars T whereby they are retained properly apart and prevented from leaning transversely toward each other. This constitutes a decided improvement in hand cars of this description, as by this means the hands of the operator, in the oscillation of the bars, will be prevented from interfering. These partition walls V^2 are provided with the slots V^3 which admit the insertion of the bolt T^1 which forms the pivot for the drive-bars and also the means for securing the housing to the main frame.

M^4 designates oppositely positioned holes provided in the main-frame bars at which position the king-block may be retained, thus the distance from the front shaft N to the seat, may be varied to suit the varying size of the operators for whom this hand car is especially devised.

I am aware that minor changes might be made in the construction of my device and the arrangement of its parts, without in the least departing from the nature or principles of my invention.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a hand car of the kind described comprising front and rear axles, wheels on the axles, a frame connecting the axles, a seat mounted on said frame between and above the axles, a gear wheel secured rigidly to the rear axle meshing with a secondary gear wheel journaled on the frame, the combination of a shaft secured in said secondary gear wheel having on its one end a crank secured and its opposite end provided with a crank detachably secured thereon and adapted to be adjusted to predetermined positions with reference to the opposite crank, said cranks being pivotally connected by connecting rods to a pair of hand levers, substantially as and for the purposes specified.

2. In a hand car of the kind described, the combination with a frame composed of parallel bars, of a gear housing composed of a continuous open member having vertical ends and sides with transversely extending journals formed integral thereon on the upper and lower sides thereof and having transversely extending lugs on the opposite sides at one end thereof, substantially as and for the purposes specified.

3. In a hand car of the kind described, the combination with the front and rear axles, wheels on said axles, a frame connecting the

axles, a pair of oscillating levers and connections for driving the car, of means whereby the motion of the oscillating bars may be varied with reference to the relative positions occupied each to the other, said means composed of a pair of cranks secured to the opposite ends of the gearing shaft, one of said cranks being detachable and having the inner face of its hub provided with radially extending channels adapted to inclose the protruding ends of a pin passed through the end of the shaft and secured therein, said shaft having a shoulder thereon adapted to fit within a corresponding recess provided in the hub of the said crank, and a screw and nut connection on the end of said shaft, substantially as and for the purposes specified.

4. In a hand car of the kind described, the combination with a frame therefor composed of parallel bars, of a hand-lever housing consisting of the opposite walls V joined together parallel by the oppositely disposed walls V² at a right angle thereto, the walls V having at their upper corners the projections V¹ and the walls V² having therein the apertures V³, the walls V² projecting upwardly beyond the plane of the top of the walls V, substantially as and for the purposes specified.

In testimony whereof I have hereunto signed my name to this specification in the presence of two subscribing witnesses.

JAMES E. DURHAM.

Witnesses:

ORA C. NORTON,
CLIFFORD R. HILTY.